

Closing the Construction Gap:

Associated Engineering Automates Inspection with Digital Tools

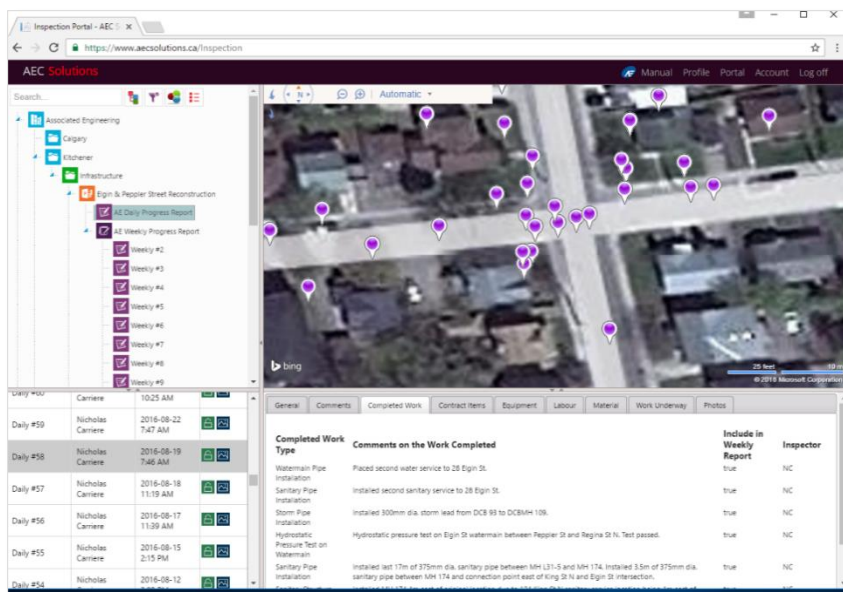
by Angus W. Stocking, L.S.

“We’re starting a new office from scratch, and now we have projects that are moving from the design phase into construction,” says Duane Lindner, P.Eng., Branch Manager of Associated Engineering Ltd.’s (AE) Kitchener office, 100 km west of Toronto. “Since we’re putting capable-but-junior staff in the field, I wanted a system that would help them, and our whole office, to be more efficient when inspecting and managing construction. With all the automation in design now, manual entry and rework in the construction phase has always struck me as a gap.”

“One of the most obvious advantages for us is the time savings—our inspectors used to spend an hour a day compiling reports, after a day in the field, and now those reports are generated and transmitted to the office in a few minutes.” (Duane Lindner, P.Eng @ Associated Engineering)

“It is a gap,” agrees Jeff Lyons. “Most of our customers have been convinced to try our solution because there’s such an obvious link missing once projects move into the field—it seems like much of the power of digital design goes away when it comes to construction.”

Lyons, and his partner Chris Stebbing formed their company in 2015 specifically to address that gap. “I’ve been working as a CAD designer, mostly civil, for more than 18 years, and for most of that time I’ve been



Builtterra Web Portal showing access to collected daily report data



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thinking about how all the digital knowledge that is generated during the design phase can be used during construction,” says Lyons. “And then Chris and I spent three years developing the Builterra platform—because of our AEC background, we know it's practical, and actually necessary today.” The Builterra Web portal and mobile app are both based on a simple, powerful idea. “Much of an engineering office’s work in the design phase ends up in the tender,” Lyons explains. “All that knowledge is accurately expressed in the quantities, in a systematic way that can be captured for use by inspectors and construction managers.”

It made sense to Lindner, and the company's background in actual engineering practice raised his confidence. “Really, it was like they had the magic formula I was looking for,” he says. “The tender tool looked good, but we had an immediate need for the construction management module (mobile app) so we started there.” In fact, he had *two* immediate needs; two projects were going to construction simultaneously, challenging his relatively inexperienced field staff.

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Builterra Inspect App running on iPad showing forms and open reports

First Steps

AE's first step, and its largest initial investment, was the purchase of several cellular-enabled tablets. The Builterra app—available in iOS or Android flavors—was loaded onto these and, working from project tenders, custom forms based on project requirements were built, and keyed to actual project quantities. “We did have to do some setup, and it helped that one of my inspectors is very tech savvy,” Lindner says. “But Builterra worked with us on this part, and provided training, so the forms came together quickly and we're able to tweak them as needed.”

Project inspectors were able to get to work “almost instantaneously” Lindner says. In practice, inspectors carry the tablets with



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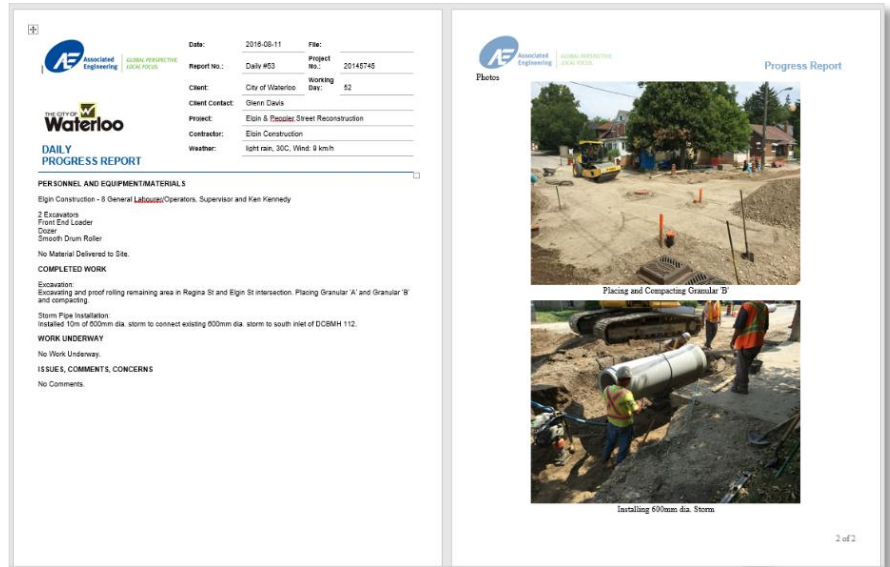


them onsite, take photos with the tablets, and use suggested fields to itemize quantities and other relevant milestones. Compared to clipboard-and-camera inspecting, there are several advantages:

Because tablet forms are accurately pre-populated based on tender documents, guesswork in the field is greatly reduced. In fact, forms can guide new or inexperienced inspectors through inspection tasks, and prompt them to take relevant photos and record correct information. “Mainly they’re selecting fields,” says Lindner. “Data entry is mostly automated, and there are fewer ways to go wrong.” Plus, all photos taken are automatically attached to the correct forms.

Form-based reports are automatically compiled, in real-time, as forms are completed in the field. “This is so important for us,” says Lindner. “One of the most obvious advantages for us is the time savings—our inspectors used to spend an hour a day compiling reports, *after* a day in

“Our client was hoping for a daily email, and now he gets a full tabulated report, with photos”



Custom Daily Progress Report (Word Format) built for Associated Engineering and City of Waterloo, Ontario

the field, and now those reports are generated and transmitted to the office in a few minutes.” Real-time data a plus cellular-enabled tablets also ties field and office together closely—that’s made a big difference for AE. “Historically our inspector would do daily reports by hand and would come in once a week to type them up. And then, because they were paper-based, they weren’t very useful.” Now, construction reports are distributed daily, and can be viewed as ‘dashboards’ that graphically portray current and cumulative data. This greatly enriches management practices. “For people in the office,” says Lindner. “...this removes excuses.”



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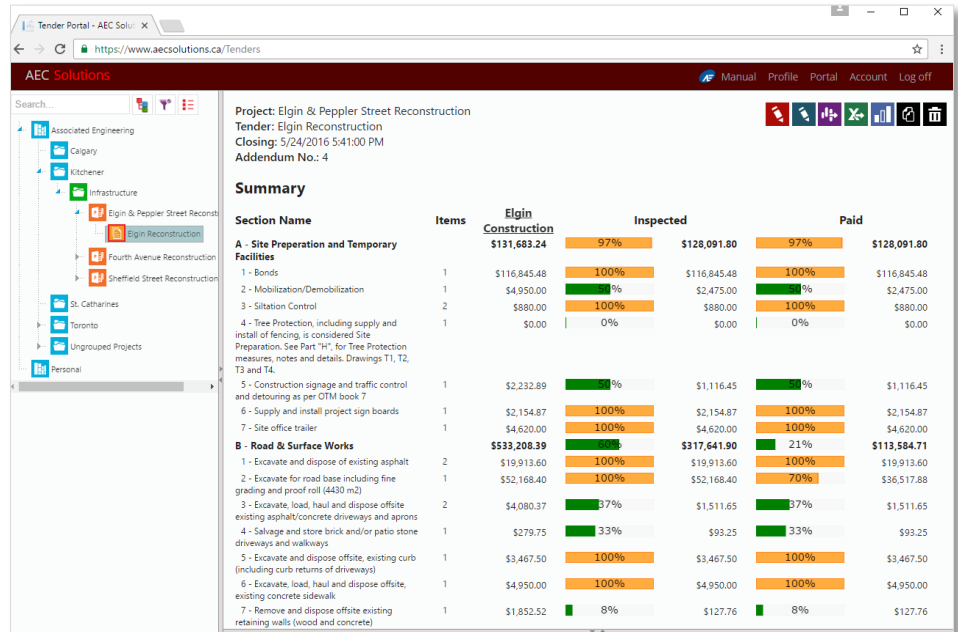


Owners and contractors are happier. “Our client was hoping for a daily email, and now he gets a full tabulated report, with photos,” Lindner says. Similarly, since contractor payments are based on inspector reports, turnaround time for checks is greatly reduced. “That obviously makes them happier,” says Lindner. “Especially since the whole process is now considerably more transparent.”

Less obvious advantages include the security and data safety features enabled by cloud hosting. “Our users never have to worry about updates or backups, and system access can be as tightly controlled as they want,” says Lyons.

Associated Engineering is a 21-office firm operating in seven provinces. Like many

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Project: Elgin & Peppier Street Reconstruction
Tender: Elgin Reconstruction
Closing: 5/24/2016 5:41:00 PM
Addendum No.: 4

Section Name	Items	Elgin Construction	Inspected	Paid
A - Site Preparation and Temporary Facilities		\$131,603.24	\$128,091.80	\$128,091.80
1 - Bonds	1	\$116,845.48	100%	\$116,845.48
2 - Mobilization/Demobilization	1	\$4,950.00	100%	\$2,475.00
3 - Siltation Control	2	\$880.00	100%	\$880.00
4 - Tree Protection, including supply and install of fencing, is considered Site Preparation. See Part "H", for Tree Protection measures, notes and details. Drawings T1, T2, T3 and T4.	1	\$0.00	0%	\$0.00
5 - Construction signage and traffic control and detouring as per OTM book 7	1	\$2,232.89	100%	\$1,116.45
6 - Supply and install project sign boards	1	\$2,154.87	100%	\$2,154.87
7 - Site office trailer	1	\$4,620.00	100%	\$4,620.00
B - Road & Surface Works		\$533,208.39	\$317,641.90	\$113,584.71
1 - Excavate and dispose of existing asphalt	2	\$19,913.60	100%	\$19,913.60
2 - Excavate for road base including fine grading and proof roll (4430 m2)	1	\$52,168.40	100%	\$36,517.88
3 - Excavate, load, haul and dispose offsite existing asphalt/concrete driveways and aprons	2	\$4,080.37	37%	\$1,511.65
4 - Salvage and store brick and/or patio stone driveways and walkways	1	\$279.75	33%	\$93.25
5 - Excavate and dispose offsite, existing curb (including curb returns of driveways)	1	\$3,467.50	100%	\$3,467.50
6 - Excavate, load, haul and dispose offsite, existing concrete sidewalks	1	\$4,950.00	100%	\$4,950.00
7 - Remove and dispose offsite existing retaining walls (wood and concrete)	1	\$1,852.52	8%	\$127.76

Builtterra showing Awarded Contract Items, Unit Pricing, Inspect Items and Approved for Payment amounts and percentages

large consulting firms, inspection routines are not standardized from office to office. That may change. “Builtterra’s mobile inspection app has really taken the Kitchener office to the next level,” Lindner says. “It’s made us more efficient, and raised quality—it’s exciting to tap into this kind of power.”

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Angus W. Stocking, L.S. is a licensed land surveyor who has been writing about infrastructure since 2002.



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